



Preparedness and response planning for foreign animal disease (FAD) incidents is crucial to protect animal health, public health, and the environment and to stabilize animal agriculture, the food supply, and the economy. This document provides a brief overview of the *Animal and Plant Health Inspection Service (APHIS) FAD Framework: Response Strategies* (FAD Preparedness and Response Plan [PReP] Manual 2-0). It is intended to be an easy to use reference for responders at all levels.

Response Goals

There are three APHIS goals of an FAD response: to (1) detect, control, and contain the disease in animals as quickly as possible; (2) eradicate the disease using strategies that seek to stabilize animal agriculture, the food supply, the economy, and to protect public health and the environment; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products.

Achieving these goals will allow individual livestock facilities, States, Tribes, regions, and industries to resume normal production as quickly as possible. They will also allow the United States to regain disease-free status without the response effort causing more disruption and damage than the disease outbreak itself.

Epidemiological Principles of Response

Three key epidemiological principles form the foundation of any FAD response:

1. Prevent contact between the disease and susceptible animals.
2. Stop the production of the FAD agent in infected or exposed animals.
3. Increase the disease resistance of susceptible animals to the disease or reduce the shedding of the FAD agent in infected or exposed animals.

Regulatory Intervention during an FAD Outbreak

An FAD outbreak in the United States may result in emergency regulatory intervention by States, Tribal Nations, and/or Federal authorities. The USDA and the affected States and Tribes will work together in a Unified Command, per the National Incident Management System, to detect, control, and contain the disease as expeditiously as possible.

Examples of State-Federal-Tribal Emergency Regulatory Interventions for an FAD Outbreak

Emergency eradication effort

Twelve months or less, regulatory intervention at time of outbreak by State-Federal-Tribal authorities.

Extended emergency eradication effort

Greater than twelve months, regulatory intervention at time of outbreak by State-Federal-Tribal authorities.

National animal disease control program

Long-term regulatory control program conducted by State-Federal-Tribal authorities.

Individual State or Tribal Nation animal disease control program

Short-term or long-term, with State or Tribal Nation requirements.

Animal disease monitored with limited or no regulatory intervention

Short-term or long-term, with little or no regulatory intervention by State-Federal-Tribal authorities.

The scope of regulatory intervention and the selection of a response strategy or strategies in an FAD outbreak will depend on the following:

- ◆ *Transmission characteristics of the FAD agent*: Rate of contagious disease agent transmission, potential for zoonotic transmission, and the number and types of susceptible animal species.
- ◆ *Consequences of the FAD outbreak*: In terms of disruptions to national security, food security, public health, animal health, the environment, and the economy; regulatory impacts for owners, growers, stakeholders, and the general public.
- ◆ *Acceptance*: Social and political acceptance of the response policy by different communities, including Local, State, Tribal, U.S. regional, U.S. national, North American, and international.
- ◆ *Scale of the outbreak*: Number of animals, species, and premises infected and the susceptible animal population density for infected or high-risk areas.
- ◆ *Rate of outbreak spread*: Rate of spread of the infection in terms of numbers and types of premises, numbers and types of animals, and the rate at which each Infected Premises (IP) leads to infection of one or more additional IP.
- ◆ *Veterinary countermeasures available*: Availability and efficacy of countermeasures, such as FAD vaccines.
- ◆ *Resources available to implement response strategies*: Capabilities and resources available to eradicate an FAD in domestic animals and to control and eradicate FAD in potential wildlife reservoirs.
- ◆ *Domestic animal disease management capabilities*: Capability, feasibility, and resources available to eradicate an FAD in domestic animals as an emergency response operation, control as an animal disease program, or monitor as an endemic animal disease.
- ◆ *Wildlife management capabilities*: Capability, feasibility, and resources available to eradicate, control, or monitor an FAD in wildlife reservoirs.



Transmission Characteristics of FAD Agents

An animal disease is either contagious, meaning it is transmitted through animal-animal contact or fomite-animal contact, or not contagious, meaning it is transmitted by another means (for example, an arthropod vector). Contagious diseases can be classified as highly contagious or not highly contagious, depending on how rapidly the disease agent can move from animal to animal and farm to farm. Highly contagious diseases will require a rapid and coordinated response to control and eliminate the agent.

Terrestrial FAD Threats

The following table identifies terrestrial FADs that pose a risk to the United States. This list is not all-inclusive and does not contain all potential terrestrial FAD threats.

FAD	Primary type of animal affected	Highly contagious disease	Vector-borne disease	Zoonotic disease potential
Highly pathogenic avian influenza	Avian and others	Yes	No	Yes
Foot-and-mouth disease (FMD)	All cloven hoofed animals	Yes	No	No
Rift Valley fever	Bovine, ovine, caprine, canine	No	Yes	Yes
Exotic Newcastle disease (ND) (virulent ND virus)	Avian	Yes	No	Yes, Minor
Nipah, Hendra (Henipavirus)	Swine, equine respectively	Yes (Nipah)	No	Yes
Classical swine fever	Swine	Yes	No	No
African swine fever	Swine	Yes	Yes	No
Japanese encephalitis	Equine, swine	No	Yes	Yes
African horse sickness	Equine, donkey, mules	No	Yes	No
Venezuelan equine encephalitis	Equine, avian	No	Yes	Yes
Contagious bovine pleuropneumonia	Bovine	Yes	No	No
Heartwater (<i>Ehrlichia ruminantium</i>)	Bovine, ovine, caprine, others	No	Yes	No
Akabane	Bovine, ovine, caprine	No	Yes	No
Swine vesicular disease	Swine	Yes	No	No
Lumpy skin disease	Bovine	No	Yes	No
Peste des petits ruminants	Caprine, ovine	Yes	No	No
Sheep pox, goat pox	Ovine, caprine	Yes	No	No
Glanders	Equine, donkey, mules	Yes	No	Yes
Dourine	Equine	No	No	No
Contagious equine metritis	Equine	No	No	No
Contagious caprine pleuropneumonia	Caprine	Yes	No	No
Nairobi sheep disease	Ovine, caprine	No	Yes	Yes, Minor
Surra (<i>Trypanosoma evansi</i>)	Equine, donkey, bovine, others	No	Yes	No
Theileriosis (East Coast fever)	Bovine	No	Yes	No
Bovine babesiosis	Bovine	No	Yes	No
Vesicular stomatitis virus	Equine, bovine, swine, ovine, caprine	No	Yes	Yes, Rare
Equine piroplasmiasis	Equine	No	Yes	No
Rabbit hemorrhagic disease	Domestic rabbits (European breeds)	Yes	No	No

FAD Pest Threats

The following table identifies FADs introduced by pests that may pose a risk to the United States. This list is not all inclusive and does not contain all potential pest threats.

Foreign pest common name	Foreign pest scientific name	Primary type of animal affected	Disease transmitted; condition caused	Zoonotic disease potential
Screwworm—New World	<i>Cochliomyia hominivorax</i>	Warm-blooded animals	Myiasis	Myiasis
Screwworm—Old World	<i>Chrysomya bezziana</i>	Warm-blooded animals	Myiasis	Myiasis
Bont tick	<i>Amblyomma hebraeum</i>	Bovine, reptiles, other species	Heartwater	Tick typhus
Tropical bont tick	<i>Amblyomma variegatum</i>	Bovine, reptiles, other species	Heartwater, Nairobi sheep disease, Crimean Congo hemorrhagic fever (CCHF)	Tick typhus CCHF Yellow fever
Brown ear tick	<i>Rhipicephalus appendiculatus</i>	Bovine, ovine, caprine, other species	Heartwater, East Coast fever, Nairobi sheep disease	Tick typhus
European castor bean tick	<i>Ixodes ricinus</i>	Bovine, ovine, caprine, other species	Bovine babesiosis	CCHF Lyme disease
Southern cattle tick	<i>Rhipicephalus microplus</i> (formerly <i>Boophilus microplus</i>)	Bovine, ovine, caprine, other species	Bovine babesiosis Anaplasmosis	Susceptible human population—splenectomized
Cattle fever tick	<i>Rhipicephalus annulatus</i> (formerly <i>Boophilus annulatus</i>)	Bovine, ovine, caprine, other species	Bovine babesiosis Anaplasmosis	Susceptible human population—splenectomized
Sheep scab, sheep mange	<i>Psoroptes ovis</i>	Bovine, ovine, other species	Mange	No
Licking fly	<i>Musca vitripennis</i>	Bovine	Bovine filariosis	No
Louse fly	<i>Hippobosca longipennis</i>	Canine, livestock, other species	Bite only	Bite only

Note: Myiasis = fly larvae feeding on the host living tissue; mange = hair loss, itching, and inflammation from mite infestation; tick typhus = *Rickettsia conorii* (human disease).

Example Response Strategies

The response strategy or strategies used for the control and eradication of an FAD in domestic livestock or poultry depends on the disease agent, zoonotic potential, ability to control the agent, economic impact, and availability of emergency vaccines. There are five strategies for controlling and eradicating a highly contagious FAD in domestic livestock or poultry; these strategies are not mutually exclusive. These strategies are as follows:

Stamping-Out

Depopulation of clinically affected and in-contact susceptible animals.

Stamping-Out Modified with Emergency Vaccination to Kill

Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, with subsequent depopulation and disposal of vaccinated animals. Depopulation and disposal can be delayed until logistically feasible.



Stamping-Out Modified with Emergency Vaccination to Slaughter

Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, with slaughter and processing of vaccinated animals, if animals are eligible for slaughter under USDA FSIS authority and rules and/or State and Tribal authority and rules.

Stamping-Out Modified with Emergency Vaccination to Live

Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, without subsequent depopulation of vaccinated animals. Vaccinated animals intended for breeding, slaughter, or other purposes live out their useful lives.

Emergency Vaccination to Live without Stamping-Out

Vaccination used without depopulation of infected animals or subsequent depopulation or slaughter of vaccinated animals.

FAD Investigations

The objectives of FAD and emerging disease investigations are to provide a veterinary medical assessment, provide presumptive and definitive diagnostic testing results, and ensure that the appropriate veterinary medical countermeasures, regulatory actions, and communications are recommended and implemented. Investigations provide confirmative diagnostic testing results as rapidly as possible so that once an FAD agent is detected, incident management will be tailored to the specific disease agent and circumstances of the outbreak. The APHIS policies and procedures for FAD investigations are defined in the *FAD Investigation Manual* (FAD PreP Manual 4-0) and the *Veterinary Services Guidance Document 12001.1*.

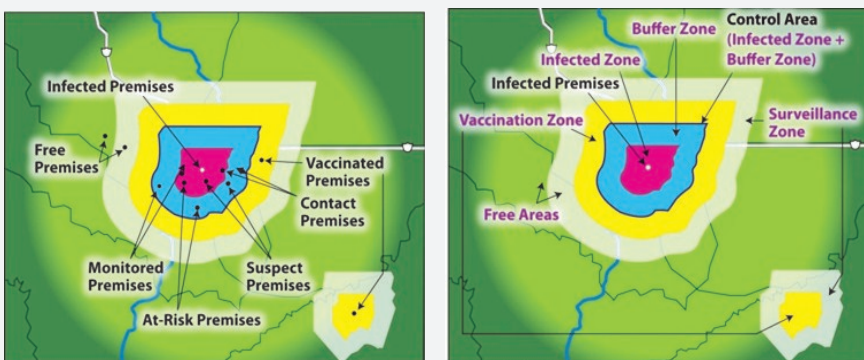
Designating Zones and Premises

Establishment of zones, area, and premises is essential for FAD response efforts. In general, an FAD outbreak response involves 7 types of zones/areas and 6 types of premises, as seen at right.

- ◆ Infected Zone (IZ): An IZ immediately surrounds an Infected Premises (IP).
- ◆ Buffer Zone (BZ): A BZ immediately surrounds an IZ or CP.
- ◆ Control Area (CA): A CA consists of an IZ and a BZ.
- ◆ Surveillance Zone (SZ): An SZ should be established in the Free Area, outside and along the border of a CA.
- ◆ Free Area (FA): The FA is the area not included in any CA, and includes an SZ but extends beyond it.
- ◆ Containment Vaccination Zone (CVZ): A CVZ is an emergency vaccination zone, typically inside a CA.
- ◆ Protection Vaccination Zone (PVZ): A PVZ is an emergency vaccination zone, typically outside a CA.

Please refer to the *FAD Response Ready Reference Guide—Zones, Areas, and Premises in an FAD Outbreak* for more information and for information on the minimum sizes of zones and areas.

Example Zones, Areas, and Premises



Note: Figures are not to scale. The Vaccination Zone can be either a Protection Vaccination Zone or Containment Vaccination Zone.

Infected Zone Buffer Zone Vaccination Zone Surveillance Zone

Recognition of Disease-Free Status

The World Organization for Animal Health (OIE) recognizes official disease statuses for member countries for foot-and-mouth disease, rinderpest, contagious bovine pleuropneumonia (CBPP), and bovine spongiform encephalopathy (BSE). An agreement between the World Trade Organization and the OIE gives the OIE a mandate to recognize disease-free areas, pest-free areas, and/or risk status for trade purposes. For example, the OIE categories for official country recognition for FMD virus as follows (*Terrestrial Animal Health Code*, 2012):

- ◆ FMD-free country where vaccination is not practiced
- ◆ FMD-free country where vaccination is practiced
- ◆ FMD-free zone where vaccination is not practiced

- ◆ FMD-free zone where vaccination is practiced
- ◆ FMD-free compartment
- ◆ FMD-infected country of zone.

Any member that wishes to be included in the list of designated disease-status countries or to change its status sends a request to the OIE Director General, accompanied by specific documentation and the relevant questionnaires for the disease. The Director General then submits the request to the Scientific Commission for evaluation. For diseases other than FMD, rinderpest, CBPP, and BSE, Member countries can self-declare disease-free status by providing relevant epidemiological evidence that requirements for disease status have been met in accordance with OIE standards.

Executing a Response Strategy

Many critical activities and tools are employed to execute the response strategies during an FAD outbreak, including the following:

- ◆ Epidemiological investigation and tracing
- ◆ Biosecurity
- ◆ Surveillance
- ◆ Diagnostics
- ◆ Quarantine and movement control
- ◆ Continuity of business
- ◆ Cleaning and disinfection
- ◆ Disposal
- ◆ Public awareness campaign.

Please refer to the *FAD Response Ready Reference Guide—Critical Activities and Tools during an FAD Response* for more information on these activities.

